

**WHITING REFINERY EMERGENCY RESPONSE
WHITING, LAKE COUNTY, ILLINOIS
DATA VALIDATION REPORT**

Date: April 15, 2014

Laboratory: ALS Environmental (ALS), Holland, Michigan

Laboratory Project #: 1404058

Data Validation Performed By: Lisa Graczyk, Weston Solutions, Inc. (WESTON[®]) Superfund Technical Assessment and Response Team (START)

Weston Analytical Work Order #/TDD #: 20405.016.005.2311.77/ S05-0005-1403-009

This data validation report has been prepared by WESTON START under the START III Region V contract. This report documents the data validation for one water sample collected for the Whiting Refinery Emergency Response Site that were analyzed for the following parameters and U.S. Environmental Protection Agency methods:

- Volatile Organic Compounds (VOC) by SW-846 Method 8260
- Semivolatile Organic Carbons (SVOC) by SW-846 Method 8270
- Metals by SW-846 Methods 6020A and 7470
- Non-Polar Oil & Grease by Method E1664
- Oil & Grease by Method E1664A
- Total Phenolics by SW-846 EPA Method 9066
- Total Organic Carbon (TOC) by SW-846 Method 9060

A level II data package was requested from ALS. The data validation was conducted in general accordance with the U.S. EPA "Contract Laboratory Program National Functional Guidance for Superfund Organic Methods Data Review" dated June 2008 and "Contract Laboratory Program National Functional Guidelines for Inorganic Superfund Data Review" dated January 2010. The Attachment contains the results summary sheets with the hand-written qualifiers applied during data validation.

Data Validation Report
Whiting Refinery Emergency Response Site
ALS Environmental
Laboratory Project #: 1404058

VOCs by SW-846 METHOD 8260

1. Samples

The following table summarizes the samples for which this data validation is being conducted.

Samples	Lab ID	Matrix	Date Collected	Date Analyzed
WCR-Water02-033114	1404058-01	Water	3/31/2014	4/3/2014

2. Holding Times

The sample was analyzed within the required holding time limit of 14 days from sample collection.

3. Blanks

A method blank was analyzed with the VOC analysis and was free of VOCs above the reporting limits.

4. Surrogate Results

The surrogate recovery results were within the laboratory-established quality control (QC) limits.

5. Laboratory Control Sample (LCS) Results

The LCS recoveries were within laboratory QC limits.

6. Matrix Spike (MS) and Matrix Spike Duplicate (MSD) Results

A site-specific MS and MSD were not analyzed with this work order. Therefore, matrix interferences could not be evaluated using the MS and MSD. For the MS and MSD that were analyzed, the recoveries and relative percent differences (RPD) were mostly within QC limits and were acceptable.

7. Overall Assessment

The VOC data are acceptable for use based on the information received.

Data Validation Report
Whiting Refinery Emergency Response Site
ALS Environmental
Laboratory Project #: 1404058

SVOCs by SW-846 METHOD 8270

1. Samples

The following table summarizes the samples for which this data validation is being conducted.

Samples	Lab ID	Matrix	Date Collected	Date Prepared	Date Analyzed
WCR-Water02-033114	1404058-01	Water	3/31/2014	4/3/2014	4/4/2014

2. Holding Times

The sample was analyzed within the required holding time limit of 7 days from sample collection to extraction and 40 days from extraction to analysis.

3. Blanks

A method blank was analyzed with the SVOC analyses and was free of target compound contamination above the reporting limits.

4. Surrogate Results

The surrogate recoveries were within QC limits.

5. LCS Results

The percent recoveries for the LCS results were within the laboratory-established QC limits.

6. MS and MSD Results

A site-specific MS and MSD were not analyzed with this work order. Therefore, matrix interferences could not be evaluated using the MS and MSD. For the MS and MSD that were analyzed, the recoveries and RPDs were mostly within QC limits and were acceptable.

7. Overall Assessment

The SVOC data are acceptable for use based on the information received.

Data Validation Report
Whiting Refinery Emergency Response Site
ALS Environmental
Laboratory Project #: 1404058

TOTAL METALS BY SW-846 METHODS 6020A AND 7470

1. Samples

The following table summarizes the samples for which this data validation is being conducted.

Samples	Lab ID	Matrix	Date Collected	Date Analyzed
WCR-Water02-033114	1404058-01	Water	3/31/2014	4/3/2014 – 4/7/2014

2. Holding Times

The sample was analyzed within the required holding time limit of 28 days from sample collection to analysis for mercury and 180 days from sample collection to analysis for all other metals.

3. Blank Results

Method blanks were analyzed with the metals analysis. The blanks were free of target analyte contamination above the reporting limits. Some metals were detected below the reporting limits in the method blanks; however, the sample concentrations were either non-detect or much higher than the blank concentrations. No qualifications were required.

4. LCS Results

The LCS recoveries were within the laboratory-established QC limits.

5. MS and MSD Results

An MS and MSD were analyzed using a sample from another project. The recoveries and RPDs were within QC limits.

6. Overall Assessment

The metals data are acceptable for use based on the information received.

Data Validation Report
Whiting Refinery Emergency Response Site
ALS Environmental
Laboratory Project #: 1404058

GENERAL CHEMISTRY PARAMETERS (Non-Polar Oil & Grease by E1664, Oil & Grease by E1664A, Total Phenolics by 9066, and TOC by 9060)

1. Samples

The following table summarizes the samples for which this data validation is being conducted.

Samples	Lab ID	Matrix	Date Collected	Date Analyzed
WCR-Water02-033114	1404058-01	Water	3/31/2014	4/3/2014 – 4/8/2014

2. Holding Times

The sample was analyzed within the holding time limit of 28 days for the general chemistry parameters being analyzed.

3. Method Blanks

Method blanks were analyzed with the analyses and were free of target analyte contamination above the reporting limit.

4. LCS Results

The percent recoveries were within QC limits for the LCSs analyzed.

5. Laboratory Duplicate Results

Laboratory duplicate RPDs were within QC limits.

6. MS and MSD Results

The percent recoveries and RPDs were within QC limits for the MS and MSDs analyzed.

7. Overall Assessment

The general chemistry data are acceptable for use based on the information received.

Data Validation Report
Whiting Refinery Emergency Response Site
ALS Environmental
Laboratory Project #: 1404058

ATTACHMENT

**ALS ENVIRONMENTAL
RESULTS SUMMARY**



10-Apr-2014

Lisa Graczyk
Weston Solutions, Inc
20 North Wacker Drive
Suite 1210
Chicago, IL 60606

Re: **Whiting Crude Release**

Work Order: **1404058**

Dear Lisa,

ALS Environmental received 1 sample on 01-Apr-2014 for the analyses presented in the following report.

The analytical data provided relates directly to the samples received by ALS Environmental and for only the analyses requested.

Sample results are compliant with NELAP standard requirements and QC results achieved laboratory specifications. Any exceptions are noted in the Case Narrative, or noted with qualifiers in the report or QC batch information. Should this laboratory report need to be reproduced, it should be reproduced in full unless written approval has been obtained from ALS Environmental. Samples will be disposed in 30 days unless storage arrangements are made.

The total number of pages in this report is 35.

If you have any questions regarding this report, please feel free to contact me.

Sincerely,

A handwritten signature in black ink, appearing to read "Tom Beamish".

Electronically approved by: Tom Beamish

Tom Beamish
Senior Project Manager



Certificate No: MN 532786

Report of Laboratory Analysis

ADDRESS 3352 128th Avenue Holland, Michigan 49424-9263 | PHONE (616) 399-6070 | FAX (616) 399-6185

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Environmental

www.alsglobal.com

RIGHT SOLUTIONS RIGHT PARTNER

Client: Weston Solutions, Inc
Project: Whiting Crude Release
Work Order: 1404058

Work Order Sample Summary

Lab Samp ID	Client Sample ID	Matrix	Tag Number	Collection Date	Date Received	Hold
1404058-01	WCR-Water02-033114	Water		03/31/14 10:00	04/01/14 09:30	<input type="checkbox"/>

Client: Weston Solutions, Inc
Project: Whiting Crude Release
WorkOrder: 1404058

**QUALIFIERS,
ACRONYMS, UNITS**

<u>Qualifier</u>	<u>Description</u>
*	Value exceeds Regulatory Limit
a	Not accredited
B	Analyte detected in the associated Method Blank above the Reporting Limit
E	Value above quantitation range
H	Analyzed outside of Holding Time
J	Analyte is present at an estimated concentration between the MDL and Report Limit
n	Not offered for accreditation
ND	Not Detected at the Reporting Limit
O	Sample amount is > 4 times amount spiked
P	Dual Column results percent difference > 40%
R	RPD above laboratory control limit
S	Spike Recovery outside laboratory control limits
U	Analyzed but not detected above the MDL

<u>Acronym</u>	<u>Description</u>
DUP	Method Duplicate
LCS	Laboratory Control Sample
LCSD	Laboratory Control Sample Duplicate
LOD	Limit of Detection (see MDL)
LOQ	Limit of Quantitation (see PQL)
MBLK	Method Blank
MDL	Method Detection Limit
MS	Matrix Spike
MSD	Matrix Spike Duplicate
PQL	Practical Quantitation Limit
RPD	Relative Percent Difference
TDL	Target Detection Limit
TNTC	Too Numerous To Count
A	APHA Standard Methods
D	ASTM
E	EPA
SW	SW-846 Update III

<u>Units Reported</u>	<u>Description</u>
mg/L	Milligrams per Liter

ALS Group USA, Corp
Date: 10-Apr-14

Client: Weston Solutions, Inc
Project: Whiting Crude Release
Sample ID: WCR-Water02-033114
Collection Date: 03/31/14 10:00 AM

Work Order: 1404058
Lab ID: 1404058-01
Matrix: WATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
MERCURY BY CVAA						
Mercury	ND		0.00020	mg/L	1	04/07/14 02:58 PM
METALS BY ICP-MS						
Aluminum	0.032		0.010	mg/L	1	04/03/14 10:21 PM
Antimony	ND		0.0050	mg/L	1	04/03/14 10:21 PM
Arsenic	ND		0.0050	mg/L	1	04/03/14 10:21 PM
Barium	0.021		0.0050	mg/L	1	04/03/14 10:21 PM
Beryllium	ND		0.0020	mg/L	1	04/03/14 10:21 PM
Cadmium	ND		0.0020	mg/L	1	04/03/14 10:21 PM
Calcium	36		0.50	mg/L	1	04/03/14 10:21 PM
Chromium	ND		0.0050	mg/L	1	04/03/14 10:21 PM
Cobalt	ND		0.0050	mg/L	1	04/03/14 10:21 PM
Copper	0.016		0.0050	mg/L	1	04/03/14 10:21 PM
Iron	ND		0.080	mg/L	1	04/03/14 10:21 PM
Lead	ND		0.0050	mg/L	1	04/03/14 10:21 PM
Magnesium	13		0.20	mg/L	1	04/03/14 10:21 PM
Manganese	ND		0.0050	mg/L	1	04/03/14 10:21 PM
Nickel	ND		0.0050	mg/L	1	04/03/14 10:21 PM
Potassium	1.8		0.20	mg/L	1	04/03/14 10:21 PM
Selenium	ND		0.0050	mg/L	1	04/03/14 10:21 PM
Silver	ND		0.0050	mg/L	1	04/03/14 10:21 PM
Sodium	12		0.20	mg/L	1	04/03/14 10:21 PM
Thallium	ND		0.0050	mg/L	1	04/03/14 10:21 PM
Vanadium	ND		0.0050	mg/L	1	04/03/14 10:21 PM
Zinc	0.012		0.010	mg/L	1	04/03/14 10:21 PM
SEMI-VOLATILE ORGANIC COMPOUNDS						
1,1'-Biphenyl	ND		0.0050	mg/L	1	04/04/14 07:16 PM
2,4,5-Trichlorophenol	ND		0.0050	mg/L	1	04/04/14 07:16 PM
2,4,6-Trichlorophenol	ND		0.0050	mg/L	1	04/04/14 07:16 PM
2,4-Dichlorophenol	ND		0.010	mg/L	1	04/04/14 07:16 PM
2,4-Dimethylphenol	ND		0.0050	mg/L	1	04/04/14 07:16 PM
2,4-Dinitrophenol	ND		0.0050	mg/L	1	04/04/14 07:16 PM
2,4-Dinitrotoluene	ND		0.0050	mg/L	1	04/04/14 07:16 PM
2,6-Dinitrotoluene	ND		0.0050	mg/L	1	04/04/14 07:16 PM
2-Chloronaphthalene	ND		0.0050	mg/L	1	04/04/14 07:16 PM
2-Chlorophenol	ND		0.0050	mg/L	1	04/04/14 07:16 PM
2-Methylnaphthalene	ND		0.0050	mg/L	1	04/04/14 07:16 PM
2-Methylphenol	ND		0.0050	mg/L	1	04/04/14 07:16 PM
2-Nitroaniline	ND		0.020	mg/L	1	04/04/14 07:16 PM

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp
Date: 10-Apr-14

Client: Weston Solutions, Inc
Project: Whiting Crude Release
Sample ID: WCR-Water02-033114
Collection Date: 03/31/14 10:00 AM

Work Order: 1404058
Lab ID: 1404058-01
Matrix: WATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
2-Nitrophenol	ND		0.0050	mg/L	1	04/04/14 07:16 PM
3,3'-Dichlorobenzidine	ND		0.0050	mg/L	1	04/04/14 07:16 PM
3-Nitroaniline	ND		0.020	mg/L	1	04/04/14 07:16 PM
4,6-Dinitro-2-methylphenol	ND		0.020	mg/L	1	04/04/14 07:16 PM
4-Bromophenyl phenyl ether	ND		0.0050	mg/L	1	04/04/14 07:16 PM
4-Chloro-3-methylphenol	ND		0.0050	mg/L	1	04/04/14 07:16 PM
4-Chloroaniline	ND		0.020	mg/L	1	04/04/14 07:16 PM
4-Chlorophenyl phenyl ether	ND		0.0050	mg/L	1	04/04/14 07:16 PM
4-Methylphenol	ND		0.0050	mg/L	1	04/04/14 07:16 PM
4-Nitroaniline	ND		0.020	mg/L	1	04/04/14 07:16 PM
4-Nitrophenol	ND		0.020	mg/L	1	04/04/14 07:16 PM
Acenaphthene	ND		0.0050	mg/L	1	04/04/14 07:16 PM
Acenaphthylene	ND		0.0050	mg/L	1	04/04/14 07:16 PM
Acetophenone	ND		0.0010	mg/L	1	04/04/14 07:16 PM
Anthracene	ND		0.0050	mg/L	1	04/04/14 07:16 PM
Atrazine	ND		0.0010	mg/L	1	04/04/14 07:16 PM
Benzaldehyde	ND		0.0010	mg/L	1	04/04/14 07:16 PM
Benzo(a)anthracene	ND		0.0050	mg/L	1	04/04/14 07:16 PM
Benzo(a)pyrene	ND		0.0050	mg/L	1	04/04/14 07:16 PM
Benzo(b)fluoranthene	ND		0.0050	mg/L	1	04/04/14 07:16 PM
Benzo(g,h,i)perylene	ND		0.0050	mg/L	1	04/04/14 07:16 PM
Benzo(k)fluoranthene	ND		0.0050	mg/L	1	04/04/14 07:16 PM
Bis(2-chloroethoxy)methane	ND		0.0050	mg/L	1	04/04/14 07:16 PM
Bis(2-chloroethyl)ether	ND		0.0050	mg/L	1	04/04/14 07:16 PM
Bis(2-chloroisopropyl)ether	ND		0.0050	mg/L	1	04/04/14 07:16 PM
Bis(2-ethylhexyl)phthalate	ND		0.0050	mg/L	1	04/04/14 07:16 PM
Butyl benzyl phthalate	ND		0.0050	mg/L	1	04/04/14 07:16 PM
Caprolactam	ND		0.010	mg/L	1	04/04/14 07:16 PM
Carbazole	ND		0.010	mg/L	1	04/04/14 07:16 PM
Chrysene	ND		0.0050	mg/L	1	04/04/14 07:16 PM
Dibenzo(a,h)anthracene	ND		0.0050	mg/L	1	04/04/14 07:16 PM
Dibenzofuran	ND		0.0050	mg/L	1	04/04/14 07:16 PM
Diethyl phthalate	ND		0.020	mg/L	1	04/04/14 07:16 PM
Dimethyl phthalate	ND		0.020	mg/L	1	04/04/14 07:16 PM
Di-n-butyl phthalate	ND		0.0050	mg/L	1	04/04/14 07:16 PM
Di-n-octyl phthalate	ND		0.0050	mg/L	1	04/04/14 07:16 PM
Fluoranthene	ND		0.0050	mg/L	1	04/04/14 07:16 PM
Fluorene	ND		0.0050	mg/L	1	04/04/14 07:16 PM
Hexachlorobenzene	ND		0.0050	mg/L	1	04/04/14 07:16 PM
Hexachlorobutadiene	ND		0.0050	mg/L	1	04/04/14 07:16 PM

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp
Date: 10-Apr-14

Client: Weston Solutions, Inc
Project: Whiting Crude Release
Sample ID: WCR-Water02-033114
Collection Date: 03/31/14 10:00 AM

Work Order: 1404058
Lab ID: 1404058-01
Matrix: WATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
Hexachlorocyclopentadiene	ND		0.020	mg/L	1	04/04/14 07:16 PM
Hexachloroethane	ND		0.0050	mg/L	1	04/04/14 07:16 PM
Indeno(1,2,3-cd)pyrene	ND		0.0050	mg/L	1	04/04/14 07:16 PM
Isophorone	ND		0.0050	mg/L	1	04/04/14 07:16 PM
Naphthalene	ND		0.0050	mg/L	1	04/04/14 07:16 PM
Nitrobenzene	ND		0.0050	mg/L	1	04/04/14 07:16 PM
N-Nitrosodi-n-propylamine	ND		0.0050	mg/L	1	04/04/14 07:16 PM
N-Nitrosodiphenylamine	ND		0.0050	mg/L	1	04/04/14 07:16 PM
Pentachlorophenol	ND		0.020	mg/L	1	04/04/14 07:16 PM
Phenanthrene	ND		0.0050	mg/L	1	04/04/14 07:16 PM
Phenol	ND		0.0050	mg/L	1	04/04/14 07:16 PM
Pyrene	ND		0.0050	mg/L	1	04/04/14 07:16 PM
Surr: 2,4,6-Tribromophenol	78.6		32-115	%REC	1	04/04/14 07:16 PM
Surr: 2-Fluorobiphenyl	70.4		32-100	%REC	1	04/04/14 07:16 PM
Surr: 2-Fluorophenol	40.9		22-59	%REC	1	04/04/14 07:16 PM
Surr: 4-Terphenyl-d14	98.6		23-112	%REC	1	04/04/14 07:16 PM
Surr: Nitrobenzene-d5	77.8		31-93	%REC	1	04/04/14 07:16 PM
Surr: Phenol-d6	27.4		13-36	%REC	1	04/04/14 07:16 PM
VOLATILE ORGANIC COMPOUNDS						
			SW8260			Analyst: BG
1,1,1-Trichloroethane	ND		0.0010	mg/L	1	04/03/14 03:58 AM
1,1,2,2-Tetrachloroethane	ND		0.0010	mg/L	1	04/03/14 03:58 AM
1,1,2-Trichloroethane	ND		0.0010	mg/L	1	04/03/14 03:58 AM
1,1,2-Trichlorotrifluoroethane	ND		0.0010	mg/L	1	04/03/14 03:58 AM
1,1-Dichloroethane	ND		0.0010	mg/L	1	04/03/14 03:58 AM
1,1-Dichloroethene	ND		0.0010	mg/L	1	04/03/14 03:58 AM
1,2,4-Trichlorobenzene	ND		0.0010	mg/L	1	04/03/14 03:58 AM
1,2-Dibromo-3-chloropropane	ND		0.0010	mg/L	1	04/03/14 03:58 AM
1,2-Dibromoethane	ND		0.0010	mg/L	1	04/03/14 03:58 AM
1,2-Dichlorobenzene	ND		0.0010	mg/L	1	04/03/14 03:58 AM
1,2-Dichloroethane	ND		0.0010	mg/L	1	04/03/14 03:58 AM
1,2-Dichloropropane	ND		0.0020	mg/L	1	04/03/14 03:58 AM
1,3-Dichlorobenzene	ND		0.0020	mg/L	1	04/03/14 03:58 AM
1,4-Dichlorobenzene	ND		0.0020	mg/L	1	04/03/14 03:58 AM
2-Butanone	ND		0.0050	mg/L	1	04/03/14 03:58 AM
2-Hexanone	ND		0.0050	mg/L	1	04/03/14 03:58 AM
4-Methyl-2-pentanone	ND		0.0050	mg/L	1	04/03/14 03:58 AM
Acetone	ND		0.020	mg/L	1	04/03/14 03:58 AM
Benzene	ND		0.0010	mg/L	1	04/03/14 03:58 AM
Bromodichloromethane	ND		0.0010	mg/L	1	04/03/14 03:58 AM
Bromoform	ND		0.0010	mg/L	1	04/03/14 03:58 AM

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp
Date: 10-Apr-14

Client: Weston Solutions, Inc
Project: Whiting Crude Release
Sample ID: WCR-Water02-033114
Collection Date: 03/31/14 10:00 AM

Work Order: 1404058
Lab ID: 1404058-01
Matrix: WATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
Bromomethane	ND		0.0010	mg/L	1	04/03/14 03:58 AM
Carbon disulfide	ND		0.0025	mg/L	1	04/03/14 03:58 AM
Carbon tetrachloride	ND		0.0010	mg/L	1	04/03/14 03:58 AM
Chlorobenzene	ND		0.0010	mg/L	1	04/03/14 03:58 AM
Chloroethane	ND		0.0010	mg/L	1	04/03/14 03:58 AM
Chloroform	ND		0.0010	mg/L	1	04/03/14 03:58 AM
Chloromethane	ND		0.0010	mg/L	1	04/03/14 03:58 AM
cis-1,2-Dichloroethene	ND		0.0010	mg/L	1	04/03/14 03:58 AM
cis-1,3-Dichloropropene	ND		0.0010	mg/L	1	04/03/14 03:58 AM
Cyclohexane	ND		0.0050	mg/L	1	04/03/14 03:58 AM
Dibromochloromethane	ND		0.0010	mg/L	1	04/03/14 03:58 AM
Dichlorodifluoromethane	ND		0.0010	mg/L	1	04/03/14 03:58 AM
Ethylbenzene	ND		0.0010	mg/L	1	04/03/14 03:58 AM
Isopropylbenzene	ND		0.0010	mg/L	1	04/03/14 03:58 AM
Methyl acetate	ND		0.0020	mg/L	1	04/03/14 03:58 AM
Methyl tert-butyl ether	ND		0.0050	mg/L	1	04/03/14 03:58 AM
Methylcyclohexane	ND		0.0050	mg/L	1	04/03/14 03:58 AM
Methylene chloride	ND		0.0050	mg/L	1	04/03/14 03:58 AM
Styrene	ND		0.0010	mg/L	1	04/03/14 03:58 AM
Tetrachloroethene	ND		0.0020	mg/L	1	04/03/14 03:58 AM
Toluene	ND		0.0010	mg/L	1	04/03/14 03:58 AM
trans-1,2-Dichloroethene	ND		0.0010	mg/L	1	04/03/14 03:58 AM
trans-1,3-Dichloropropene	ND		0.0010	mg/L	1	04/03/14 03:58 AM
Trichloroethene	ND		0.0010	mg/L	1	04/03/14 03:58 AM
Trichlorofluoromethane	ND		0.0010	mg/L	1	04/03/14 03:58 AM
Vinyl chloride	ND		0.0010	mg/L	1	04/03/14 03:58 AM
Xylenes, Total	ND		0.0030	mg/L	1	04/03/14 03:58 AM
Surr: 1,2-Dichloroethane-d4	102		70-120	%REC	1	04/03/14 03:58 AM
Surr: 4-Bromofluorobenzene	97.0		75-120	%REC	1	04/03/14 03:58 AM
Surr: Dibromofluoromethane	98.9		85-115	%REC	1	04/03/14 03:58 AM
Surr: Toluene-d8	98.9		85-120	%REC	1	04/03/14 03:58 AM
NON-POLAR MATERIAL			E1664			Analyst: ND
Non-Polar Material	ND		5.0	mg/L	1	04/08/14 09:00 AM
OIL AND GREASE			E1664A			Analyst: ND
Oil and Grease	ND		5.0	mg/L	1	04/08/14 09:00 AM
PHENOLICS, TOTAL			SW9066		Prep: E420.x / 4/2/14	Analyst: JB
Phenolics, Total	ND		0.010	mg/L	1	04/03/14 11:34 AM
ORGANIC CARBON, TOTAL			SW9060			Analyst: ED

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp**Date:** 10-Apr-14**Client:** Weston Solutions, Inc**Project:** Whiting Crude Release**Sample ID:** WCR-Water02-033114**Collection Date:** 03/31/14 10:00 AM**Work Order:** 1404058**Lab ID:** 1404058-01**Matrix:** WATER

Analyses	Result	Qual	Report Limit	Units	Dilution Factor	Date Analyzed
Organic Carbon, Total	2.2		0.50	mg/L	1	04/03/14 12:23 PM

Note: See Qualifiers page for a list of qualifiers and their definitions.

ALS Group USA, Corp

Date: 10-Apr-14

Client: Weston Solutions, Inc
Work Order: 1404058
Project: Whiting Crude Release

QC BATCH REPORT

Batch ID: 57254 Instrument ID HG1 Method: SW7470

MBLK			Sample ID: MBLK-57254-57254			Units: mg/L		Analysis Date: 04/07/14 02:33 PM		
Client ID:		Run ID: HG1_140407A			SeqNo: 2701501		Prep Date: 04/04/14		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	ND	0.00020								
LCS			Sample ID: LCS-57254-57254			Units: mg/L		Analysis Date: 04/07/14 02:35 PM		
Client ID:		Run ID: HG1_140407A			SeqNo: 2701502		Prep Date: 04/04/14		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.00193	0.00020	0.002	0	96.5	80-120		0		
MS			Sample ID: 1404057-01CMS			Units: mg/L		Analysis Date: 04/07/14 02:47 PM		
Client ID:		Run ID: HG1_140407A			SeqNo: 2701509		Prep Date: 04/04/14		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.002061	0.00020	0.002	-0.000023	104	75-125		0		
MSD			Sample ID: 1404057-01CMSD			Units: mg/L		Analysis Date: 04/07/14 02:56 PM		
Client ID:		Run ID: HG1_140407A			SeqNo: 2701518		Prep Date: 04/04/14		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Mercury	0.002032	0.00020	0.002	-0.000023	103	75-125	0.002061	1.42	20	

The following samples were analyzed in this batch:

1404058-01D

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

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Client: Weston Solutions, Inc
Work Order: 1404058
Project: Whiting Crude Release

QC BATCH REPORT

Batch ID: 57200 Instrument ID ICPMS1 Method: SW6020A

MBLK		Sample ID: MBLK-57200-57200			Units: mg/L		Analysis Date: 04/03/14 08:04 PM				
Client ID:		Run ID: ICPMS1_140403A			SeqNo: 2699093	Prep Date: 04/03/14	DF: 1				
Analyte		Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony		ND		0.0050							
Arsenic		ND		0.0050							
Barium		ND		0.0050							
Beryllium		ND		0.0020							
Cadmium		ND		0.0020							
Calcium		0.1484		0.50							J
Chromium		ND		0.0050							
Cobalt		ND		0.0050							
Copper		ND		0.0050							
Iron		0.007899		0.080							J
Lead		ND		0.0050							
Magnesium		0.06565		0.20							J
Manganese		0.0001004		0.0050							J
Nickel		ND		0.0050							
Potassium		0.04607		0.20							J
Selenium		0.0007958		0.0050							J
Silver		ND		0.0050							
Sodium		0.1159		0.20							J
Thallium		ND		0.0050							
Vanadium		ND		0.0050							
Zinc		ND		0.010							

MBLK		Sample ID: MBLK-57200-57200			Units: mg/L		Analysis Date: 04/04/14 02:36 PM				
Client ID:		Run ID: ICPMS1_140404A			SeqNo: 2699097	Prep Date: 04/03/14	DF: 1				
Analyte		Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum		0.001235		0.010							J

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

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Client: Weston Solutions, Inc
Work Order: 1404058
Project: Whiting Crude Release

QC BATCH REPORT

Batch ID: **57200** Instrument ID **ICPMS1** Method: **SW6020A**

LCS	Sample ID: LCS-57200-57200			Units: mg/L		Analysis Date: 04/03/14 08:10 PM				
Client ID:	Run ID: ICPMS1_140403A			SeqNo: 2699095		Prep Date: 04/03/14		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Antimony	0.09506	0.0050	0.1	0	95.1	80-120	0	0		
Arsenic	0.09156	0.0050	0.1	0	91.6	80-120	0	0		
Barium	0.09358	0.0050	0.1	0	93.6	80-120	0	0		
Beryllium	0.09685	0.0020	0.1	0	96.8	80-120	0	0		
Cadmium	0.09503	0.0020	0.1	0	95	80-120	0	0		
Calcium	9.306	0.50	10	0	93.1	80-120	0	0		
Chromium	0.08929	0.0050	0.1	0	89.3	80-120	0	0		
Cobalt	0.08918	0.0050	0.1	0	89.2	80-120	0	0		
Copper	0.09183	0.0050	0.1	0	91.8	80-120	0	0		
Iron	9.333	0.080	10	0	93.3	80-120	0	0		
Lead	0.09142	0.0050	0.1	0	91.4	80-120	0	0		
Magnesium	9.143	0.20	10	0	91.4	80-120	0	0		
Manganese	0.09136	0.0050	0.1	0	91.4	80-120	0	0		
Nickel	0.08986	0.0050	0.1	0	89.9	80-120	0	0		
Potassium	9.125	0.20	10	0	91.2	80-120	0	0		
Selenium	0.09294	0.0050	0.1	0	92.9	80-120	0	0		
Silver	0.08769	0.0050	0.1	0	87.7	80-120	0	0		
Sodium	8.969	0.20	10	0	89.7	80-120	0	0		
Thallium	0.08869	0.0050	0.1	0	88.7	80-120	0	0		
Vanadium	0.092	0.0050	0.1	0	92	80-120	0	0		
Zinc	0.09559	0.010	0.1	0	95.6	80-120	0	0		

LCS	Sample ID: LCS-57200-57200			Units: mg/L		Analysis Date: 04/04/14 02:43 PM				
Client ID:	Run ID: ICPMS1_140404A			SeqNo: 2699008		Prep Date: 04/03/14		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	0.09101	0.010	0.1	0	91	80-120	0	0		

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Weston Solutions, Inc
Work Order: 1404058
Project: Whiting Crude Release

QC BATCH REPORT

Batch ID: 57200 Instrument ID ICPMS1 Method: SW6020A

MS	Sample ID: 14031413-02AMS			Units: mg/L		Analysis Date: 04/03/14 10:02 PM				
Client ID:	Run ID: ICPMS1_140403A			SeqNo: 2699121		Prep Date: 04/03/14		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	1.013	0.10	1	0.02451	98.8	75-125		0		
Antimony	0.9489	0.050	1	0.001837	94.7	75-125		0		
Arsenic	0.972	0.050	1	0.0005695	97.1	75-125		0		
Barium	1.216	0.050	1	0.2365	98	75-125		0		
Beryllium	0.934	0.020	1	0.0005091	93.3	75-125		0		
Cadmium	0.938	0.020	1	0.0005312	93.7	75-125		0		
Calcium	272.1	5.0	100	174	98.1	75-125		0		
Chromium	0.9486	0.050	1	0.001037	94.8	75-125		0		
Cobalt	0.9314	0.050	1	0.002633	92.9	75-125		0		
Copper	0.9348	0.050	1	0.005053	93	75-125		0		
Iron	100.4	0.80	100	4.785	95.6	75-125		0		
Lead	0.9469	0.050	1	0.00115	94.6	75-125		0		
Magnesium	116.8	2.0	100	14.24	103	75-125		0		
Manganese	1.464	0.050	1	0.5013	96.3	75-125		0		
Nickel	0.9391	0.050	1	0.005886	93.3	75-125		0		
Potassium	131.8	2.0	100	31.49	100	75-125		0		
Selenium	0.8987	0.050	1	-0.0003594	89.9	75-125		0		
Silver	0.8435	0.050	1	0.000274	84.3	75-125		0		
Thallium	0.9164	0.050	1	0.0008541	91.6	75-125		0		
Vanadium	1.011	0.050	1	0.002739	101	75-125		0		
Zinc	0.9719	0.10	1	0.01789	95.4	75-125		0		

MS	Sample ID: 14031413-02AMS			Units: mg/L		Analysis Date: 04/04/14 01:46 PM				
Client ID:	Run ID: ICPMS1_140404A			SeqNo: 2699899		Prep Date: 04/03/14		DF: 10		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sodium	4286	20	100	4152	134	75-125		0		SO

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

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Client: Weston Solutions, Inc
Work Order: 1404058
Project: Whiting Crude Release

QC BATCH REPORT

Batch ID: 57200 Instrument ID ICPMS1 Method: SW6020A

MSD	Sample ID: 14031413-02AMSD			Units: mg/L		Analysis Date: 04/03/14 10:09 PM				
Client ID:	Run ID: ICPMS1_140403A			SeqNo: 2699122		Prep Date: 04/03/14		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Aluminum	1.043	0.10	1	0.02451	102	75-125	1.013	2.92	20	
Antimony	0.9415	0.050	1	0.001837	94	75-125	0.9489	0.783	20	
Arsenic	0.994	0.050	1	0.0005695	99.3	75-125	0.972	2.24	20	
Barium	1.237	0.050	1	0.2365	100	75-125	1.216	1.71	20	
Beryllium	0.9706	0.020	1	0.0005091	97	75-125	0.934	3.84	20	
Cadmium	0.9582	0.020	1	0.0005312	95.8	75-125	0.938	2.13	20	
Calcium	281.5	5.0	100	174	108	75-125	272.1	3.4	20	
Chromium	0.9404	0.050	1	0.001037	93.9	75-125	0.9486	0.868	20	
Cobalt	0.9253	0.050	1	0.002633	92.3	75-125	0.9314	0.657	20	
Copper	0.9245	0.050	1	0.005053	91.9	75-125	0.9348	1.11	20	
Iron	99.73	0.80	100	4.785	94.9	75-125	100.4	0.67	20	
Lead	0.9709	0.050	1	0.00115	97	75-125	0.9469	2.5	20	
Magnesium	121	2.0	100	14.24	107	75-125	116.8	3.53	20	
Manganese	1.451	0.050	1	0.5013	95	75-125	1.464	0.892	20	
Nickel	0.9255	0.050	1	0.005886	92	75-125	0.9391	1.46	20	
Potassium	135.4	2.0	100	31.49	104	75-125	131.8	2.69	20	
Selenium	0.9143	0.050	1	-0.0003594	91.5	75-125	0.8987	1.72	20	
Silver	0.8403	0.050	1	0.000274	84	75-125	0.8435	0.38	20	
Thallium	0.9444	0.050	1	0.0008541	94.4	75-125	0.9164	3.01	20	
Vanadium	0.9918	0.050	1	0.002739	98.9	75-125	1.011	1.92	20	
Zinc	0.9627	0.10	1	0.01789	94.5	75-125	0.9719	0.951	20	

MSD	Sample ID: 14031413-02AMSD			Units: mg/L		Analysis Date: 04/04/14 01:53 PM				
Client ID:	Run ID: ICPMS1_140404A			SeqNo: 2699900		Prep Date: 04/03/14		DF: 10		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Sodium	4173	20	100	4152	21	75-125	4286	2.67	20	SO

The following samples were analyzed in this batch: 1404058-01D

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC Page: 5 of 25

Client: Weston Solutions, Inc
Work Order: 1404058
Project: Whiting Crude Release

QC BATCH REPORT

Batch ID: 57176 Instrument ID SVMS8 Method: SW8270

M BLK	Sample ID: SBLKW1-57176-57176		Units: µg/L		Analysis Date: 04/04/14 11:02 AM			
Client ID:	Run ID: SVMS8_140404A		SeqNo: 2700280		Prep Date: 04/03/14		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD Limit Qual
1,1'-Biphenyl	ND		5.0					
2,4,5-Trichlorophenol	ND		5.0					
2,4,6-Trichlorophenol	ND		5.0					
2,4-Dichlorophenol	ND		10					
2,4-Dimethylphenol	ND		5.0					
2,4-Dinitrophenol	ND		5.0					
2,4-Dinitrotoluene	ND		5.0					
2,6-Dinitrotoluene	ND		5.0					
2-Chloronaphthalene	ND		5.0					
2-Chlorophenol	ND		5.0					
2-Methylnaphthalene	ND		5.0					
2-Methylphenol	ND		5.0					
2-Nitroaniline	ND		20					
2-Nitrophenol	ND		5.0					
3,3'-Dichlorobenzidine	ND		5.0					
3-Nitroaniline	ND		20					
4,6-Dinitro-2-methylphenol	ND		20					
4-Bromophenyl phenyl ether	ND		5.0					
4-Chloro-3-methylphenol	ND		5.0					
4-Chloroaniline	ND		20					
4-Chlorophenyl phenyl ether	ND		5.0					
4-Methylphenol	ND		5.0					
4-Nitroaniline	ND		20					
4-Nitrophenol	ND		20					
Acenaphthene	ND		5.0					
Acenaphthylene	ND		5.0					
Acetophenone	ND		1.0					
Anthracene	ND		5.0					
Atrazine	ND		1.0					
Benzaldehyde	ND		1.0					
Benzo(a)anthracene	ND		5.0					
Benzo(a)pyrene	ND		5.0					
Benzo(b)fluoranthene	ND		5.0					
Benzo(g,h,i)perylene	ND		5.0					
Benzo(k)fluoranthene	ND		5.0					
Bis(2-chloroethoxy)methane	ND		5.0					
Bis(2-chloroethyl)ether	ND		5.0					
Bis(2-chloroisopropyl)ether	ND		5.0					
Bis(2-ethylhexyl)phthalate	ND		5.0					
Butyl benzyl phthalate	ND		5.0					
Caprolactam	ND		10					
Carbazole	ND		10					

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

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Client: Weston Solutions, Inc
Work Order: 1404058
Project: Whiting Crude Release

QC BATCH REPORT

Batch ID: 57176	Instrument ID SVMS8	Method: SW8270					
Chrysene		ND	5.0				
Dibenzo(a,h)anthracene		ND	5.0				
Dibenzofuran		ND	5.0				
Diethyl phthalate		ND	20				
Dimethyl phthalate		ND	20				
Di-n-butyl phthalate		ND	5.0				
Di-n-octyl phthalate		ND	5.0				
Fluoranthene		ND	5.0				
Fluorene		ND	5.0				
Hexachlorobenzene		ND	5.0				
Hexachlorobutadiene		ND	5.0				
Hexachlorocyclopentadiene		ND	20				
Hexachloroethane		ND	5.0				
Indeno(1,2,3-cd)pyrene		ND	5.0				
Isophorone		ND	5.0				
Naphthalene		ND	5.0				
Nitrobenzene		ND	5.0				
N-Nitrosodi-n-propylamine		ND	5.0				
N-Nitrosodiphenylamine		ND	5.0				
Pentachlorophenol		ND	20				
Phenanthrrene		ND	5.0				
Phenol		ND	5.0				
Pyrene		ND	5.0				
<i>Surr: 2,4,6-Tribromophenol</i>	30.23	0	50	0	60.5	38-115	0
<i>Surr: 2-Fluorobiphenyl</i>	31.72	0	50	0	63.4	32-100	0
<i>Surr: 2-Fluorophenol</i>	19.15	0	50	0	38.3	22-59	0
<i>Surr: 4-Terphenyl-d14</i>	45.82	0	50	0	91.6	23-112	0
<i>Surr: Nitrobenzene-d5</i>	35.48	0	50	0	71	31-93	0
<i>Surr: Phenol-d6</i>	11.82	0	50	0	23.6	13-36	0

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

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Client: Weston Solutions, Inc
Work Order: 1404058
Project: Whiting Crude Release

QC BATCH REPORT

Batch ID: 57176 Instrument ID SVMS8 Method: SW8270

LCS	Sample ID: SLCSW1-57176-57176			Units: µg/L		Analysis Date: 04/04/14 11:23 AM		
Client ID:	Run ID: SVMS8_140404A			SeqNo: 2700281		Prep Date: 04/03/14		DF: 1
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD Limit %RPD Qual
2,4,5-Trichlorophenol	14.37	5.0	20	0	71.8	50-110	0	
2,4,6-Trichlorophenol	13.79	5.0	20	0	69	50-115	0	
2,4-Dichlorophenol	13.07	10	20	0	65.4	50-105	0	
2,4-Dimethylphenol	12.01	5.0	20	0	60	30-110	0	
2,4-Dinitrophenol	12.48	5.0	20	0	62.4	15-140	0	
2,4-Dinitrotoluene	15.08	5.0	20	0	75.4	50-120	0	
2,6-Dinitrotoluene	14.77	5.0	20	0	73.8	50-115	0	
2-Chloronaphthalene	14.49	5.0	20	0	72.4	50-105	0	
2-Chlorophenol	12.81	5.0	20	0	64	35-105	0	
2-Methylnaphthalene	13.81	5.0	20	0	69	45-105	0	
2-Methylphenol	11.55	5.0	20	0	57.8	40-110	0	
2-Nitroaniline	15.92	20	20	0	79.6	50-115	0	J
2-Nitrophenol	13.9	5.0	20	0	69.5	40-115	0	
3-Nitroaniline	14.59	20	20	0	73	20-125	0	J
4,6-Dinitro-2-methylphenol	14.74	20	20	0	73.7	40-130	0	J
4-Bromophenyl phenyl ether	15.89	5.0	20	0	79.4	50-115	0	
4-Chloro-3-methylphenol	13.72	5.0	20	0	68.6	45-110	0	
4-Chloroaniline	15.23	20	20	0	76.2	15-110	0	J
4-Chlorophenyl phenyl ether	14.5	5.0	20	0	72.5	50-110	0	
4-Methylphenol	9.9	5.0	20	0	49.5	30-110	0	
4-Nitroaniline	14.13	20	20	0	70.6	35-150	0	J
4-Nitrophenol	5.09	20	20	0	25.4	1-58	0	J
Acenaphthene	14.04	5.0	20	0	70.2	45-110	0	
Acenaphthylene	15.42	5.0	20	0	77.1	50-105	0	
Anthracene	16.78	5.0	20	0	83.9	55-110	0	
Benzo(a)anthracene	15.81	5.0	20	0	79	55-110	0	
Benzo(a)pyrene	16.25	5.0	20	0	81.2	55-110	0	
Benzo(b)fluoranthene	16.8	5.0	20	0	84	45-120	0	
Benzo(g,h,i)perylene	16.33	5.0	20	0	81.6	40-125	0	
Benzo(k)fluoranthene	16.98	5.0	20	0	84.9	45-125	0	
Bis(2-chloroethoxy)methane	14.59	5.0	20	0	73	45-105	0	
Bis(2-chloroethyl)ether	15.9	5.0	20	0	79.5	35-110	0	
Bis(2-chloroisopropyl)ether	16.54	5.0	20	0	82.7	25-130	0	
Bis(2-ethylhexyl)phthalate	15.67	5.0	20	0	78.4	40-125	0	
Butyl benzyl phthalate	15.7	5.0	20	0	78.5	45-115	0	
Carbazole	16.76	10	20	0	83.8	50-150	0	
Chrysene	16.62	5.0	20	0	83.1	55-110	0	
Dibenzo(a,h)anthracene	15.19	5.0	20	0	76	40-125	0	
Dibenzofuran	14.33	5.0	20	0	71.6	55-105	0	
Diethyl phthalate	16.12	20	20	0	80.6	40-120	0	J
Dimethyl phthalate	15.49	20	20	0	77.4	25-125	0	J
Di-n-butyl phthalate	16.73	5.0	20	0	83.6	55-115	0	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

Client: Weston Solutions, Inc
Work Order: 1404058
Project: Whiting Crude Release

QC BATCH REPORT

Batch ID: 57176	Instrument ID SVMS8	Method: SW8270					
Di-n-octyl phthalate	15.68	5.0	20	0	78.4	35-135	0
Fluoranthene	16.77	5.0	20	0	83.8	55-115	0
Fluorene	14.9	5.0	20	0	74.5	50-110	0
Hexachlorobenzene	15.32	5.0	20	0	76.6	50-110	0
Hexachlorobutadiene	12.26	5.0	20	0	61.3	25-105	0
Hexachlorocyclopentadiene	10.97	20	20	0	54.8	25-105	0
Hexachloroethane	12.73	5.0	20	0	63.6	30-95	0
Indeno(1,2,3-cd)pyrene	18.13	5.0	20	0	90.6	45-125	0
Isophorone	15.65	5.0	20	0	78.2	50-110	0
Naphthalene	13.15	5.0	20	0	65.8	40-100	0
Nitrobenzene	14.96	5.0	20	0	74.8	45-110	0
N-Nitrosodi-n-propylamine	15.72	5.0	20	0	78.6	35-130	0
N-Nitrosodiphenylamine	16.13	5.0	20	0	80.6	50-110	0
Pentachlorophenol	13.13	20	20	0	65.6	40-115	0
Phenanthrene	15.83	5.0	20	0	79.2	50-115	0
Phenol	5.19	5.0	20	0	26	12-43	0
Pyrene	17.65	5.0	20	0	88.2	50-130	0
<i>Surr: 2,4,6-Tribromophenol</i>	37.35	0	50	0	74.7	38-115	0
<i>Surr: 2-Fluorobiphenyl</i>	34.28	0	50	0	68.6	32-100	0
<i>Surr: 2-Fluorophenol</i>	19.09	0	50	0	38.2	22-59	0
<i>Surr: 4-Terphenyl-d14</i>	46.26	0	50	0	92.5	23-112	0
<i>Surr: Nitrobenzene-d5</i>	41.24	0	50	0	82.5	31-93	0
<i>Surr: Phenol-d6</i>	12.93	0	50	0	25.9	13-36	0

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC Page: 9 of 25

Client: Weston Solutions, Inc
Work Order: 1404058
Project: Whiting Crude Release

QC BATCH REPORT

Batch ID: 57176 Instrument ID SVMS8 Method: SW8270

MS	Sample ID: 1404130-15B MS			Units: µg/L		Analysis Date: 04/04/14 01:49 PM				
	Client ID:	Run ID: SVMS8_140404A		SeqNo: 2700286	Prep Date: 04/03/14	DF: 1				
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
2,4,5-Trichlorophenol	159	50	200	0	79.5	50-110	0	0		
2,4,6-Trichlorophenol	157.7	50	200	0	78.8	50-115	0	0		
2,4-Dichlorophenol	144.9	100	200	0	72.4	50-105	0	0		
2,4-Dimethylphenol	155.7	50	200	0	77.8	30-110	0	0		
2,4-Dinitrophenol	16.1	50	200	0	8.05	15-140	0	0		JS
2,4-Dinitrotoluene	157.9	50	200	0	79	50-120	0	0		
2,6-Dinitrotoluene	151.9	50	200	0	76	50-115	0	0		
2-Chloronaphthalene	148.4	50	200	0	74.2	50-105	0	0		
2-Chlorophenol	146.9	50	200	0	73.4	35-105	0	0		
2-Methylnaphthalene	140.6	50	200	0	70.3	45-105	0	0		
2-Methylphenol	131.2	50	200	0	65.6	40-110	0	0		
2-Nitroaniline	171.6	200	200	0	85.8	50-115	0	0		J
2-Nitrophenol	140.1	50	200	0	70	40-115	0	0		
3-Nitroaniline	150.2	200	200	0	75.1	20-125	0	0		J
4,6-Dinitro-2-methylphenol	45.8	200	200	0	22.9	40-130	0	0		JS
4-Bromophenyl phenyl ether	162.6	50	200	0	81.3	50-115	0	0		
4-Chloro-3-methylphenol	157.2	50	200	0	78.6	45-110	0	0		
4-Chloroaniline	121.6	200	200	0	60.8	15-110	0	0		J
4-Chlorophenyl phenyl ether	150.4	50	200	0	75.2	50-110	0	0		
4-Methylphenol	116	50	200	0	58	30-110	0	0		
4-Nitroaniline	144.2	200	200	0	72.1	35-150	0	0		J
4-Nitrophenol	38.7	200	200	0	19.4	1-58	0	0		J
Acenaphthene	130.2	50	200	0	65.1	45-110	0	0		
Acenaphthylene	156.9	50	200	0	78.4	50-105	0	0		
Anthracene	171.4	50	200	0	85.7	55-110	0	0		
Benzo(a)anthracene	169.6	50	200	0	84.8	55-110	0	0		
Benzo(a)pyrene	179.6	50	200	0	89.8	55-110	0	0		
Benzo(b)fluoranthene	191.3	50	200	0	95.6	45-120	0	0		
Benzo(g,h,i)perylene	157.5	50	200	0	78.8	40-125	0	0		
Benzo(k)fluoranthene	189.2	50	200	0	94.6	45-125	0	0		
Bis(2-chloroethoxy)methane	147.6	50	200	0	73.8	45-105	0	0		
Bis(2-chloroethyl)ether	151.5	50	200	0	75.8	35-110	0	0		
Bis(2-chloroisopropyl)ether	154.4	50	200	0	77.2	25-130	0	0		
Bis(2-ethylhexyl)phthalate	195.7	50	200	0	97.8	40-125	0	0		
Butyl benzyl phthalate	197.1	50	200	0	98.6	45-115	0	0		
Carbazole	171.8	100	200	0	85.9	50-150	0	0		
Chrysene	163.2	50	200	0	81.6	55-110	0	0		
Dibenzo(a,h)anthracene	153.8	50	200	0	76.9	40-125	0	0		
Dibenzofuran	147.6	50	200	0	73.8	55-105	0	0		
Diethyl phthalate	164.6	200	200	0	82.3	40-120	0	0		J
Dimethyl phthalate	160.7	200	200	0	80.4	25-125	0	0		J
Di-n-butyl phthalate	179.7	50	200	0	89.8	55-115	0	0		

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

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Client: Weston Solutions, Inc
Work Order: 1404058
Project: Whiting Crude Release

QC BATCH REPORT

Batch ID: 57176	Instrument ID SVMS8	Method: SW8270					
Di-n-octyl phthalate	258.7	50	200	0	129	35-135	0
Fluoranthene	173.7	50	200	0	86.8	55-115	0
Fluorene	152.1	50	200	0	76	50-110	0
Hexachlorobenzene	152.5	50	200	0	76.2	50-110	0
Hexachlorobutadiene	128	50	200	0	64	25-105	0
Hexachlorocyclopentadiene	67.1	200	200	0	33.6	25-105	0
Hexachloroethane	131.3	50	200	0	65.6	30-95	0
Indeno(1,2,3-cd)pyrene	195.2	50	200	0	97.6	45-125	0
Isophorone	159.6	50	200	0	79.8	50-110	0
Naphthalene	134.5	50	200	0	67.2	40-100	0
Nitrobenzene	153	50	200	0	76.5	45-110	0
N-Nitrosodi-n-propylamine	162	50	200	0	81	35-130	0
N-Nitrosodiphenylamine	162.5	50	200	0	81.2	50-110	0
Pentachlorophenol	113.5	200	200	0	56.8	40-115	0
Phenanthrene	155.9	50	200	0	78	50-115	0
Phenol	53.1	50	200	0	26.6	12-43	0
Pyrene	211	50	200	0	106	50-130	0
<i>Surr: 2,4,6-Tribromophenol</i>	394.5	0	500	0	78.9	38-115	0
<i>Surr: 2-Fluorobiphenyl</i>	347.5	0	500	0	69.5	32-100	0
<i>Surr: 2-Fluorophenol</i>	210.2	0	500	0	42	22-59	0
<i>Surr: 4-Terphenyl-d14</i>	555	0	500	0	111	23-112	0
<i>Surr: Nitrobenzene-d5</i>	413.4	0	500	0	82.7	31-93	0
<i>Surr: Phenol-d6</i>	135.5	0	500	0	27.1	13-36	0

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

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Client: Weston Solutions, Inc
Work Order: 1404058
Project: Whiting Crude Release

QC BATCH REPORT

Batch ID: 57176		Instrument ID SVMS8		Method: SW8270								
MSD	Sample ID: 1404130-15B MSD				Units: µg/L		Analysis Date: 04/04/14 02:09 PM					
Client ID:	Run ID: SVMS8_140404A				SeqNo: 2700287		Prep Date: 04/03/14		DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual		
2,4,5-Trichlorophenol	163.6	50	200	0	81.8	50-110	159	2.85	30			
2,4,6-Trichlorophenol	166	50	200	0	83	50-115	157.7	5.13	30			
2,4-Dichlorophenol	150.5	100	200	0	75.2	50-105	144.9	3.79	30			
2,4-Dimethylphenol	137.9	50	200	0	69	30-110	155.7	12.1	30			
2,4-Dinitrophenol	28.2	50	200	0	14.1	15-140	16.1	0	30	JS		
2,4-Dinitrotoluene	160.6	50	200	0	80.3	50-120	157.9	1.7	30			
2,6-Dinitrotoluene	159.3	50	200	0	79.6	50-115	151.9	4.76	30			
2-Chloronaphthalene	152.6	50	200	0	76.3	50-105	148.4	2.79	30			
2-Chlorophenol	148.8	50	200	0	74.4	35-105	146.9	1.29	30			
2-Methylnaphthalene	145.5	50	200	0	72.8	45-105	140.6	3.43	30			
2-Methylphenol	135.5	50	200	0	67.8	40-110	131.2	3.22	30			
2-Nitroaniline	174.4	200	200	0	87.2	50-115	171.6	0	30	J		
2-Nitrophenol	149.1	50	200	0	74.6	40-115	140.1	6.22	30			
3-Nitroaniline	166	200	200	0	83	20-125	150.2	0	30	J		
4,6-Dinitro-2-methylphenol	60.7	200	200	0	30.4	40-130	45.8	0	30	JS		
4-Bromophenyl phenyl ether	160.1	50	200	0	80	50-115	162.6	1.55	30			
4-Chloro-3-methylphenol	170.5	50	200	0	85.2	45-110	157.2	8.12	30			
4-Chloroaniline	154.7	200	200	0	77.4	15-110	121.6	0	30	J		
4-Chlorophenyl phenyl ether	151.7	50	200	0	75.8	50-110	150.4	0.861	30			
4-Methylphenol	126.6	50	200	0	63.3	30-110	116	8.74	30			
4-Nitroaniline	157.8	200	200	0	78.9	35-150	144.2	0	30	J		
4-Nitrophenol	50.4	200	200	0	25.2	1-58	38.7	0	0	J		
Acenaphthene	133.9	50	200	0	67	45-110	130.2	2.8	30			
Acenaphthylene	158.5	50	200	0	79.2	50-105	156.9	1.01	30			
Anthracene	168.8	50	200	0	84.4	55-110	171.4	1.53	30			
Benzo(a)anthracene	170.7	50	200	0	85.4	55-110	169.6	0.646	30			
Benzo(a)pyrene	179.4	50	200	0	89.7	55-110	179.6	0.111	30			
Benzo(b)fluoranthene	192.7	50	200	0	96.4	45-120	191.3	0.729	30			
Benzo(g,h,i)perylene	152	50	200	0	76	40-125	157.5	3.55	30			
Benzo(k)fluoranthene	190.5	50	200	0	95.2	45-125	189.2	0.685	30			
Bis(2-chloroethoxy)methane	150.7	50	200	0	75.4	45-105	147.6	2.08	30			
Bis(2-chloroethyl)ether	157.6	50	200	0	78.8	35-110	151.5	3.95	30			
Bis(2-chloroisopropyl)ether	157.9	50	200	0	79	25-130	154.4	2.24	30			
Bis(2-ethylhexyl)phthalate	191.8	50	200	0	95.9	40-125	195.7	2.01	30			
Butyl benzyl phthalate	189.3	50	200	0	94.6	45-115	197.1	4.04	30			
Carbazole	175.1	100	200	0	87.6	50-150	171.8	1.9	30			
Chrysene	166.8	50	200	0	83.4	55-110	163.2	2.18	30			
Dibenzo(a,h)anthracene	149.1	50	200	0	74.6	40-125	153.8	3.1	30			
Dibenzofuran	149.8	50	200	0	74.9	55-105	147.6	1.48	30			
Diethyl phthalate	173	200	200	0	86.5	40-120	164.6	0	30	J		
Dimethyl phthalate	165.4	200	200	0	82.7	25-125	160.7	0	30	J		
Di-n-butyl phthalate	180	50	200	0	90	55-115	179.7	0.167	30			

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

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Client: Weston Solutions, Inc
Work Order: 1404058
Project: Whiting Crude Release

QC BATCH REPORT

Batch ID: 57176	Instrument ID SVMS8	Method: SW8270							
Di-n-octyl phthalate	251.8	50	200	0	126	35-135	258.7	2.7	30
Fluoranthene	174.7	50	200	0	87.4	55-115	173.7	0.574	30
Fluorene	154.8	50	200	0	77.4	50-110	152.1	1.76	30
Hexachlorobenzene	154.6	50	200	0	77.3	50-110	152.5	1.37	30
Hexachlorobutadiene	132.1	50	200	0	66	25-105	128	3.15	30
Hexachlorocyclopentadiene	63.3	200	200	0	31.6	25-105	67.1	0	30 J
Hexachloroethane	129.1	50	200	0	64.6	30-95	131.3	1.69	30
Indeno(1,2,3-cd)pyrene	189.1	50	200	0	94.6	45-125	195.2	3.17	30
Isophorone	165.1	50	200	0	82.6	50-110	159.6	3.39	30
Naphthalene	138.2	50	200	0	69.1	40-100	134.5	2.71	30
Nitrobenzene	160.2	50	200	0	80.1	45-110	153	4.6	30
N-Nitrosodi-n-propylamine	168.4	50	200	0	84.2	35-130	162	3.87	30
N-Nitrosodiphenylamine	164.2	50	200	0	82.1	50-110	162.5	1.04	30
Pentachlorophenol	117.4	200	200	0	58.7	40-115	113.5	0	30 J
Phanthrene	161.2	50	200	0	80.6	50-115	155.9	3.34	30
Phenol	62.7	50	200	0	31.4	12-43	53.1	16.6	30
Pyrene	199.9	50	200	0	100	50-130	211	5.4	30
<i>Surr: 2,4,6-Tribromophenol</i>	397.5	0	500	0	79.5	38-115	394.5	0.758	40
<i>Surr: 2-Fluorobiphenyl</i>	349.2	0	500	0	69.8	32-100	347.5	0.488	40
<i>Surr: 2-Fluorophenol</i>	235.1	0	500	0	47	22-59	210.2	11.2	40
<i>Surr: 4-Terphenyl-d14</i>	528.4	0	500	0	106	23-112	555	4.91	40
<i>Surr: Nitrobenzene-d5</i>	420.8	0	500	0	84.2	31-93	413.4	1.77	40
<i>Surr: Phenol-d6</i>	159.6	0	500	0	31.9	13-36	135.5	16.3	40

The following samples were analyzed in this batch:

1404058-01B

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

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Client: Weston Solutions, Inc
Work Order: 1404058
Project: Whiting Crude Release

QC BATCH REPORT

Batch ID: R138303A Instrument ID VMS6 Method: SW8260

MLBK	Sample ID: VBLKW2-140402-R138303A			Units: µg/L		Analysis Date: 04/02/14 08:32 PM				
Client ID:	Run ID: VMS6_140402A			SeqNo: 2697650		Prep Date:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1-Trichloroethane	ND	1.0								
1,1,2,2-Tetrachloroethane	ND	1.0								
1,1,2-Trichloroethane	ND	1.0								
1,1,2-Trichlorotrifluoroethane	ND	1.0								
1,1-Dichloroethane	ND	1.0								
1,1-Dichloroethene	ND	1.0								
1,2,4-Trichlorobenzene	ND	1.0								
1,2-Dibromo-3-chloropropane	ND	1.0								
1,2-Dibromoethane	ND	1.0								
1,2-Dichlorobenzene	ND	1.0								
1,2-Dichloroethane	ND	1.0								
1,2-Dichloropropane	ND	2.0								
1,3-Dichlorobenzene	ND	2.0								
1,4-Dichlorobenzene	ND	2.0								
2-Butanone	ND	5.0								
2-Hexanone	ND	5.0								
4-Methyl-2-pentanone	ND	5.0								
Acetone	ND	20								
Benzene	ND	1.0								
Bromodichloromethane	ND	1.0								
Bromoform	ND	1.0								
Bromomethane	ND	1.0								
Carbon disulfide	ND	2.5								
Carbon tetrachloride	ND	1.0								
Chlorobenzene	ND	1.0								
Chloroethane	ND	1.0								
Chloroform	ND	1.0								
Chloromethane	ND	1.0								
cis-1,2-Dichloroethene	ND	1.0								
cis-1,3-Dichloropropene	ND	1.0								
Cyclohexane	ND	5.0								
Dibromochloromethane	ND	1.0								
Dichlorodifluoromethane	ND	1.0								
Ethylbenzene	ND	1.0								
Isopropylbenzene	ND	1.0								
Methyl acetate	ND	2.0								
Methyl tert-butyl ether	ND	5.0								
Methylcyclohexane	ND	5.0								
Methylene chloride	ND	5.0								
Styrene	ND	1.0								
Tetrachloroethene	ND	2.0								
Toluene	ND	1.0								

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC Page: 14 of 25

Client: Weston Solutions, Inc
Work Order: 1404058
Project: Whiting Crude Release

QC BATCH REPORT

Batch ID: R138303A	Instrument ID VMS6	Method: SW8260					
trans-1,2-Dichloroethene	ND	1.0					
trans-1,3-Dichloropropene	ND	1.0					
Trichloroethene	ND	1.0					
Trichlorofluoromethane	ND	1.0					
Vinyl chloride	ND	1.0					
Xylenes, Total	ND	3.0					
<i>Surr: 1,2-Dichloroethane-d4</i>	19.86	0	20	0	99.3	70-120	0
<i>Surr: 4-Bromofluorobenzene</i>	19.55	0	20	0	97.8	75-120	0
<i>Surr: Dibromofluoromethane</i>	19.55	0	20	0	97.8	85-115	0
<i>Surr: Toluene-d8</i>	19.85	0	20	0	99.2	85-120	0

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC Page: 15 of 25

Client: Weston Solutions, Inc
Work Order: 1404058
Project: Whiting Crude Release

QC BATCH REPORT

Batch ID: R138303A

Instrument ID VMS6

Method: SW8260

LCS	Sample ID: VLCSW1-140402-R138303A			Units: µg/L		Analysis Date: 04/02/14 07:39 PM				
Client ID:	Run ID: VMS6_140402A			SeqNo: 2697649		Prep Date:		DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1-Trichloroethane	21.31	1.0	20	0	107	65-130	0	0		
1,1,2,2-Tetrachloroethane	22.02	1.0	20	0	110	65-130	0	0		
1,1,2-Trichloroethane	21.38	1.0	20	0	107	75-125	0	0		
1,1-Dichloroethane	22.35	1.0	20	0	112	70-135	0	0		
1,1-Dichloroethene	23.38	1.0	20	0	117	70-130	0	0		
1,2,4-Trichlorobenzene	21.42	1.0	20	0	107	65-135	0	0		
1,2-Dibromo-3-chloropropane	18.2	1.0	20	0	91	50-130	0	0		
1,2-Dibromoethane	24.98	1.0	20	0	125	87-179	0	0		
1,2-Dichlorobenzene	21.6	1.0	20	0	108	70-120	0	0		
1,2-Dichloroethane	20.29	1.0	20	0	101	87-179	0	0		
1,2-Dichloropropane	20.71	2.0	20	0	104	75-125	0	0		
1,3-Dichlorobenzene	22.05	2.0	20	0	110	75-125	0	0		
1,4-Dichlorobenzene	20.86	2.0	20	0	104	75-125	0	0		
2-Butanone	24.84	5.0	20	0	124	30-150	0	0		
2-Hexanone	21.2	5.0	20	0	106	55-130	0	0		
4-Methyl-2-pentanone	27.37	5.0	20	0	137	77-178	0	0		
Acetone	22.07	20	20	0	110	40-140	0	0		
Benzene	22.24	1.0	20	0	111	80-120	0	0		
Bromodichloromethane	19.45	1.0	20	0	97.2	75-120	0	0		
Bromoform	16.43	1.0	20	0	82.2	70-130	0	0		
Bromomethane	26.92	1.0	20	0	135	30-145	0	0		
Carbon disulfide	24.25	2.5	20	0	121	35-165	0	0		
Carbon tetrachloride	20.35	1.0	20	0	102	65-140	0	0		
Chlorobenzene	21.69	1.0	20	0	108	80-120	0	0		
Chloroethane	21.25	1.0	20	0	106	60-135	0	0		
Chloroform	21.83	1.0	20	0	109	65-135	0	0		
Chloromethane	20.06	1.0	20	0	100	70-125	0	0		
cis-1,2-Dichloroethene	22.11	1.0	20	0	111	70-125	0	0		
cis-1,3-Dichloropropene	20.4	1.0	20	0	102	70-130	0	0		
Dibromochloromethane	16.95	1.0	20	0	84.8	60-135	0	0		
Dichlorodifluoromethane	15.58	1.0	20	0	77.9	30-155	0	0		
Ethylbenzene	23.1	1.0	20	0	116	75-125	0	0		
Isopropylbenzene	20.31	1.0	20	0	102	75-125	0	0		
Methyl tert-butyl ether	22.93	5.0	20	0	115	65-125	0	0		
Methylene chloride	21.89	5.0	20	0	109	55-140	0	0		
Styrene	20.03	1.0	20	0	100	65-135	0	0		
Tetrachloroethene	23.14	2.0	20	0	116	45-150	0	0		
Toluene	22.51	1.0	20	0	113	75-120	0	0		
trans-1,2-Dichloroethene	24.07	1.0	20	0	120	60-140	0	0		
trans-1,3-Dichloropropene	19.93	1.0	20	0	99.6	55-140	0	0		
Trichloroethene	22.7	1.0	20	0	114	70-125	0	0		
Trichlorofluoromethane	20.75	1.0	20	0	104	60-145	0	0		

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

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Client: Weston Solutions, Inc
Work Order: 1404058
Project: Whiting Crude Release

QC BATCH REPORT

Batch ID: R138303A	Instrument ID VMS6	Method: SW8260					
Vinyl chloride	19.41	1.0	20	0	97	50-145	0
Xylenes, Total	62.02	3.0	60	0	103	75-130	0
<i>Surr: 1,2-Dichloroethane-d4</i>	19.89	0	20	0	99.4	70-120	0
<i>Surr: 4-Bromofluorobenzene</i>	20.12	0	20	0	101	75-120	0
<i>Surr: Dibromofluoromethane</i>	21.02	0	20	0	105	85-115	0
<i>Surr: Toluene-d8</i>	20.32	0	20	0	102	85-120	0

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC Page: 17 of 25

Client: Weston Solutions, Inc
Work Order: 1404058
Project: Whiting Crude Release

QC BATCH REPORT

Batch ID: R138303A Instrument ID VMS6 Method: SW8260

MS	Sample ID: 1404077-02A MS			Units: µg/L		Analysis Date: 04/03/14 05:43 AM			
Client ID:	Run ID: VMS6_140402A			SeqNo: 2697661		Prep Date:		DF: 1	
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD Limit	Qual
1,1,1-Trichloroethane	22.55	1.0	20	1.38	106	65-130	0		
1,1,2,2-Tetrachloroethane	20.72	1.0	20	0	104	65-130	0		
1,1,2-Trichloroethane	20.78	1.0	20	0	104	75-125	0		
1,1-Dichloroethane	25.31	1.0	20	1.85	117	70-135	0		
1,1-Dichloroethene	27.23	1.0	20	3.04	121	70-130	0		
1,2,4-Trichlorobenzene	20.59	1.0	20	0	103	65-135	0		
1,2-Dibromo-3-chloropropane	15.22	1.0	20	0	76.1	50-130	0		
1,2-Dibromoethane	24.63	1.0	20	0	123	81-158	0		
1,2-Dichlorobenzene	21.53	1.0	20	0	108	70-120	0		
1,2-Dichloroethane	20.6	1.0	20	0	103	70-130	0		
1,2-Dichloropropane	20.97	2.0	20	0	105	75-125	0		
1,3-Dichlorobenzene	22.19	2.0	20	0	111	75-125	0		
1,4-Dichlorobenzene	21.37	2.0	20	0	107	75-125	0		
2-Butanone	24.38	5.0	20	0	122	30-150	0		
2-Hexanone	20.24	5.0	20	0	101	55-130	0		
4-Methyl-2-pentanone	26.47	5.0	20	0	132	73-162	0		
Acetone	29.57	20	20	4.94	123	40-140	0		
Benzene	23.11	1.0	20	0	116	80-120	0		
Bromodichloromethane	17.87	1.0	20	0	89.4	75-120	0		
Bromoform	14.08	1.0	20	0	70.4	70-130	0		
Bromomethane	23.04	1.0	20	0	115	30-145	0		
Carbon disulfide	23.75	2.5	20	0	119	35-165	0		
Carbon tetrachloride	20.66	1.0	20	0	103	65-140	0		
Chlorobenzene	21.76	1.0	20	0	109	80-120	0		
Chloroethane	22.28	1.0	20	0	111	60-135	0		
Chloroform	21.87	1.0	20	0	109	65-135	0		
Chloromethane	18.71	1.0	20	0	93.6	70-125	0		
cis-1,2-Dichloroethene	65.17	1.0	20	40.72	122	70-125	0		
cis-1,3-Dichloropropene	18.76	1.0	20	0	93.8	70-130	0		
Dibromochloromethane	14.7	1.0	20	0	73.5	60-135	0		
Dichlorodifluoromethane	17.04	1.0	20	0	85.2	30-155	0		
Ethylbenzene	23.46	1.0	20	0	117	75-125	0		
Isopropylbenzene	20.82	1.0	20	0	104	75-125	0		
Methyl tert-butyl ether	21.42	5.0	20	0	107	65-125	0		
Methylene chloride	21.65	5.0	20	0	108	55-140	0		
Styrene	19.85	1.0	20	0	99.2	65-135	0		
Tetrachloroethene	27.45	2.0	20	2.07	127	45-150	0		
Toluene	22.88	1.0	20	0	114	75-120	0		
trans-1,2-Dichloroethene	27.04	1.0	20	1.79	126	60-140	0		
trans-1,3-Dichloropropene	17.61	1.0	20	0	88	55-140	0		
Trichloroethene	58.28	1.0	20	25.84	162	70-125	0		S
Trichlorofluoromethane	22.04	1.0	20	0	110	60-145	0		

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC Page: 18 of 25

Client: Weston Solutions, Inc
Work Order: 1404058
Project: Whiting Crude Release

QC BATCH REPORT

Batch ID: R138303A	Instrument ID VMS6	Method: SW8260					
Vinyl chloride	24.53	1.0	20	4.05	102	50-145	0
Xylenes, Total	62.47	3.0	60	0	104	75-130	0
<i>Surr: 1,2-Dichloroethane-d4</i>	20.15	0	20	0	101	70-120	0
<i>Surr: 4-Bromofluorobenzene</i>	20.03	0	20	0	100	75-120	0
<i>Surr: Dibromofluoromethane</i>	20.21	0	20	0	101	85-115	0
<i>Surr: Toluene-d8</i>	20.05	0	20	0	100	85-120	0

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC Page: 19 of 25

Client: Weston Solutions, Inc
Work Order: 1404058
Project: Whiting Crude Release

QC BATCH REPORT

Batch ID: R138303A

Instrument ID VMS6

Method: SW8260

MSD	Sample ID: 1404077-02A MSD			Units: µg/L			Analysis Date: 04/03/14 06:09 AM			
Client ID:	Run ID: VMS6_140402A			SeqNo: 2697662		Prep Date:	DF: 1			
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
1,1,1-Trichloroethane	21.77	1.0	20	1.38	102	65-130	22.55	3.52	30	
1,1,2,2-Tetrachloroethane	20.91	1.0	20	0	105	65-130	20.72	0.913	30	
1,1,2-Trichloroethane	20.62	1.0	20	0	103	75-125	20.78	0.773	30	
1,1-Dichloroethane	24.76	1.0	20	1.85	115	70-135	25.31	2.2	30	
1,1-Dichloroethene	25.99	1.0	20	3.04	115	70-130	27.23	4.66	30	
1,2,4-Trichlorobenzene	20.9	1.0	20	0	104	65-135	20.59	1.49	30	
1,2-Dibromo-3-chloropropane	15.4	1.0	20	0	77	50-130	15.22	1.18	30	
1,2-Dibromoethane	24.23	1.0	20	0	121	81-158	24.63	1.64	30	
1,2-Dichlorobenzene	21.3	1.0	20	0	106	70-120	21.53	1.07	30	
1,2-Dichloroethane	20.32	1.0	20	0	102	70-130	20.6	1.37	30	
1,2-Dichloropropane	20.61	2.0	20	0	103	75-125	20.97	1.73	30	
1,3-Dichlorobenzene	21.65	2.0	20	0	108	75-125	22.19	2.46	30	
1,4-Dichlorobenzene	20.84	2.0	20	0	104	75-125	21.37	2.51	30	
2-Butanone	25.26	5.0	20	0	126	30-150	24.38	3.55	30	
2-Hexanone	21.02	5.0	20	0	105	55-130	20.24	3.78	30	
4-Methyl-2-pentanone	28.18	5.0	20	0	141	73-162	26.47	6.26	30	
Acetone	32.04	20	20	4.94	136	40-140	29.57	8.02	30	
Benzene	22.14	1.0	20	0	111	80-120	23.11	4.29	30	
Bromodichloromethane	17.61	1.0	20	0	88	75-120	17.87	1.47	30	
Bromoform	14.29	1.0	20	0	71.4	70-130	14.08	1.48	30	
Bromomethane	23.09	1.0	20	0	115	30-145	23.04	0.217	30	
Carbon disulfide	22.82	2.5	20	0	114	35-165	23.75	3.99	30	
Carbon tetrachloride	19.86	1.0	20	0	99.3	65-140	20.66	3.95	30	
Chlorobenzene	21.31	1.0	20	0	107	80-120	21.76	2.09	30	
Chloroethane	21.95	1.0	20	0	110	60-135	22.28	1.49	30	
Chloroform	21.87	1.0	20	0	109	65-135	21.87	0	30	
Chloromethane	21.47	1.0	20	0	107	70-125	18.71	13.7	30	
cis-1,2-Dichloroethene	64.52	1.0	20	40.72	119	70-125	65.17	1	30	
cis-1,3-Dichloropropene	18.56	1.0	20	0	92.8	70-130	18.76	1.07	30	
Dibromochloromethane	14.88	1.0	20	0	74.4	60-135	14.7	1.22	30	
Dichlorodifluoromethane	16.2	1.0	20	0	81	30-155	17.04	5.05	30	
Ethylbenzene	23.1	1.0	20	0	116	75-125	23.46	1.55	30	
Isopropylbenzene	20.63	1.0	20	0	103	75-125	20.82	0.917	30	
Methyl tert-butyl ether	21.9	5.0	20	0	110	65-125	21.42	2.22	30	
Methylene chloride	21.76	5.0	20	0	109	55-140	21.65	0.507	30	
Styrene	19.66	1.0	20	0	98.3	65-135	19.85	0.962	30	
Tetrachloroethene	26	2.0	20	2.07	120	45-150	27.45	5.43	30	
Toluene	22.33	1.0	20	0	112	75-120	22.88	2.43	30	
trans-1,2-Dichloroethene	26.24	1.0	20	1.79	122	60-140	27.04	3	30	
trans-1,3-Dichloropropene	17.73	1.0	20	0	88.6	55-140	17.61	0.679	30	
Trichloroethene	55.1	1.0	20	25.84	146	70-125	58.28	5.61	30	S
Trichlorofluoromethane	21.59	1.0	20	0	108	60-145	22.04	2.06	30	

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC Page: 20 of 25

Client: Weston Solutions, Inc
Work Order: 1404058
Project: Whiting Crude Release

QC BATCH REPORT

Batch ID: R138303A	Instrument ID VMS6	Method: SW8260								
Vinyl chloride	23.69	1.0	20	4.05	98.2	50-145	24.53	3.48	30	
Xylenes, Total	60.97	3.0	60	0	102	75-130	62.47	2.43	30	
<i>Surr: 1,2-Dichloroethane-d4</i>	19.95	0	20	0	99.8	70-120	20.15	0.998	30	
<i>Surr: 4-Bromofluorobenzene</i>	20.1	0	20	0	100	75-120	20.03	0.349	30	
<i>Surr: Dibromofluoromethane</i>	20.19	0	20	0	101	85-115	20.21	0.099	30	
<i>Surr: Toluene-d8</i>	19.71	0	20	0	98.6	85-120	20.05	1.71	30	

The following samples were analyzed in this batch: | 1404058-01C |

Client: Weston Solutions, Inc
Work Order: 1404058
Project: Whiting Crude Release

QC BATCH REPORT

Batch ID: 57190 Instrument ID LCHAT Method: SW9066

Mblk	Sample ID: MBLK-57190-57190			Units: mg/L		Analysis Date: 04/03/14 11:34 AM		
Client ID:	Run ID: LCHAT_140403A			SeqNo: 2697980	Prep Date: 04/02/14	DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD Limit Qual
Phenolics, Total	ND	0.010						

Mblk	Sample ID: MBLK-57190-57190			Units: mg/L		Analysis Date: 04/03/14 11:34 AM		
Client ID:	Run ID: LCHAT_140403A			SeqNo: 2697995	Prep Date: 04/02/14	DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD Limit Qual
Phenolics, Total	ND	0.010						

LCS	Sample ID: LCS-57190-57190			Units: mg/L		Analysis Date: 04/03/14 11:34 AM		
Client ID:	Run ID: LCHAT_140403A			SeqNo: 2697981	Prep Date: 04/02/14	DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD Limit Qual
Phenolics, Total	0.09553	0.010	0.1	0	95.5	75-110	0	

LCS	Sample ID: LCS-57190-57190			Units: mg/L		Analysis Date: 04/03/14 11:34 AM		
Client ID:	Run ID: LCHAT_140403A			SeqNo: 2697996	Prep Date: 04/02/14	DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD Limit Qual
Phenolics, Total	0.09553	0.010	0.1	0	95.5	90-110	0	

MS	Sample ID: 1404058-01A MS			Units: mg/L		Analysis Date: 04/03/14 11:34 AM		
Client ID: WCR-Water02-033114	Run ID: LCHAT_140403A			SeqNo: 2697987	Prep Date: 04/02/14	DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD Limit Qual
Phenolics, Total	0.3004	0.033	0.3333	0.0005017	90	61-131	0	

MSD	Sample ID: 1404058-01A MSD			Units: mg/L		Analysis Date: 04/03/14 11:34 AM		
Client ID: WCR-Water02-033114	Run ID: LCHAT_140403A			SeqNo: 2697988	Prep Date: 04/02/14	DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD Limit Qual
Phenolics, Total	0.3165	0.033	0.3333	0.0005017	94.8	61-131	0.3004	5.23 15

The following samples were analyzed in this batch: 1404058-01A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC Page: 22 of 25

Client: Weston Solutions, Inc
Work Order: 1404058
Project: Whiting Crude Release

QC BATCH REPORT

Batch ID: R138335b Instrument ID TOC2 Method: SW9060

MLBK	Sample ID: WBLKW1-140402-R138335b			Units: mg/L		Analysis Date: 04/02/14 10:53 PM		
Client ID:	Run ID: TOC2_140402A			SeqNo: 2698359		Prep Date: DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD Limit Qual
Organic Carbon, Total	ND	0.50						

LCS	Sample ID: WLCSW1-140402-R138335b			Units: mg/L		Analysis Date: 04/02/14 11:24 PM		
Client ID:	Run ID: TOC2_140402A			SeqNo: 2698361		Prep Date: DF: 1		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD Limit Qual
Organic Carbon, Total	5.306	0.50	5	0	106	80-120	0	

MS	Sample ID: 1404058-01EMS			Units: mg/L		Analysis Date: 04/03/14 01:25 PM		
Client ID: WCR-Water02-033114	Run ID: TOC2_140402A			SeqNo: 2698367		Prep Date: DF: 4		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD Limit Qual
Organic Carbon, Total	7.876	2.0	5	2.38	110	75-125	0	

MSD	Sample ID: 1404058-01EMSD			Units: mg/L		Analysis Date: 04/03/14 01:57 PM		
Client ID: WCR-Water02-033114	Run ID: TOC2_140402A			SeqNo: 2698368		Prep Date: DF: 4		
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD Limit Qual
Organic Carbon, Total	7.84	2.0	5	2.38	109	75-125	7.876	0.458 20

The following samples were analyzed in this batch: 1404058-01E

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC Page: 23 of 25

Client: Weston Solutions, Inc
Work Order: 1404058
Project: Whiting Crude Release

QC BATCH REPORT

Batch ID: R138583 Instrument ID O&G Method: E1664A

Mblk	Sample ID: MB-R138583-R138583			Units: mg/L		Analysis Date: 04/08/14 09:00 AM		
Client ID:	Run ID: O&G_140408A			SeqNo: 2703760		Prep Date:		DF: 1
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD Limit Qual
Oil and Grease	ND	5.0						

LCS	Sample ID: LCS-R138583-R138583			Units: mg/L		Analysis Date: 04/08/14 09:00 AM		
Client ID:	Run ID: O&G_140408A			SeqNo: 2703761		Prep Date:		DF: 1
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD Limit Qual
Oil and Grease	35.8	5.0	40	0	89.5	78-114	0	

MS	Sample ID: 1404349-02A MS			Units: mg/L		Analysis Date: 04/08/14 09:00 AM		
Client ID:	Run ID: O&G_140408A			SeqNo: 2703781		Prep Date:		DF: 1
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD Limit Qual
Oil and Grease	36.78	5.0	40	0.33	91.1	78-114	0	

DUP	Sample ID: 1404349-04A DUP			Units: mg/L		Analysis Date: 04/08/14 09:00 AM		
Client ID:	Run ID: O&G_140408A			SeqNo: 2703783		Prep Date:		DF: 1
Analyte	Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	RPD %RPD Limit Qual
Oil and Grease	ND	5.0	0	0	0 0	-0	1.44	0 18

The following samples were analyzed in this batch: 1404058-01A

Note: See Qualifiers Page for a list of Qualifiers and their explanation.

QC Page: 24 of 25

Client: Weston Solutions, Inc
Work Order: 1404058
Project: Whiting Crude Release

QC BATCH REPORT

Batch ID: R138584 Instrument ID O&G Method: E1664

MBLK		Sample ID: MB-R138584-R138584			Units: mg/L		Analysis Date: 04/08/14 09:00 AM				
Client ID:		Run ID: O&G_140408B			SeqNo: 2703786	Prep Date:	DF: 1				
Analyte		Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Non-Polar Material		ND		5.0							

LCS		Sample ID: LCS-R138584-R138584			Units: mg/L		Analysis Date: 04/08/14 09:00 AM				
Client ID:		Run ID: O&G_140408B			SeqNo: 2703787	Prep Date:	DF: 1				
Analyte		Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Non-Polar Material		16.7	5.0	20	0	83.5	64-132		0		

MS		Sample ID: 1404349-02A MS			Units: mg/L		Analysis Date: 04/08/14 09:00 AM				
Client ID:		Run ID: O&G_140408B			SeqNo: 2703790	Prep Date:	DF: 1				
Analyte		Result	PQL	SPK Val	SPK Ref Value	%REC	Control Limit	RPD Ref Value	%RPD	RPD Limit	Qual
Non-Polar Material		17.89	5.0	20	0.33	87.8	64-132		0		

The following samples were analyzed in this batch: 1404058-01A



Environmental

Cincinnati, OH
+1 513 733 5336

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Chain of Custody Form

Page 1 of 1

COC ID: 85373

Houston, TX
+1 281 530 5656

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Spring City, PA
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Salt Lake City, UT
+1 801 266 7700

South Charleston, WV
+1 304 356 3168

York, PA
+1 717 505 5280

ALS Project Manager: 133 ALS Work Order #: 1404058

Customer Information		Project Information		Parameter/Method Request for Analysis														
Purchase Order		Project Name		A	TOTAL ORGANIC CARBON													
Work Order		Project Number		B	OIL & GREASE													
Company Name	Weston Solutions, Inc	Bill To Company	Weston Solutions, Inc	C	NON-POLAR OIL & GREASE (TPH)													
Send Report To	Lisa Graczyk	Invoice Attn	Lisa Graczyk	D	SVOCs (ACID/BASE NEUTRALS)													
Address	20 North Wacker Drive Suite 1210	Address	20 North Wacker Drive Suite 1210	E	VOCs													
City/State/Zip	Chicago, IL 60606	City/State/Zip	Chicago, IL 60606	F	PHENOLS (AAAP)													
Phone	(312) 424-3300	Phone	(312) 424-3300	G	MERCURY													
Fax	(312) 424-3330	Fax	(312) 424-3330	H	METALS													
e-Mail Address		e-Mail Address		I														
J																		

No.	Sample Description	Date	Time	Matrix	Pres.	# Bottles	A	B	C	D	E	F	G	H	I	J	Hold
1	WCR-WATER02 - 033114	3/31/14	10:00	W	MULTIPLE	9	X	X	X	X	X	X	X	X			
2	NO ADDITIONAL																
3																	
4																	
5																	
6																	
7																	
8																	
9																	
10																	

Sampler(s) Please Print & Sign				Shipment Method	Required Turnaround Time: (Check Box)				Results Due Date:						
<u>JEFF BRYN ARK</u>					<input checked="" type="checkbox"/> Std 10 WK Days	<input type="checkbox"/> 5 WK Days	<input type="checkbox"/> 2 WK Days	<input type="checkbox"/> 24 Hour	Notes:						
Relinquished by:	Date: 3/31/14	Time: 12:50	Received by: <u>Parikh</u>												
Relinquished by:	Date: 3/31/14	Time: 1630	Received by (Laboratory): <u>Joseph</u>												
Logged by (Laboratory):	Date: 4/1/14	Time: 1440	Checked by (Laboratory): <u>Jeff</u>												
Preservative Key:	1-HCl	2-HNO ₃	3-H ₂ SO ₄	4-NaOH	5-Na ₂ S ₂ O ₃	6-NaHSO ₄	7-Other	8-4°C	9-5035	Cooler ID	Cooler Temp.	QC Package: (Check One Box Below)			
											3.4°C	<input checked="" type="checkbox"/> Level II Std QC	<input type="checkbox"/> TRRP Checklist		
												<input type="checkbox"/> Level III Std QC/Raw Data	<input type="checkbox"/> TRRP Level IV		
												<input type="checkbox"/> Level IV SW846/CLP			
												<input type="checkbox"/> Other			

Note: 1. Any changes must be made in writing once samples and COC Form have been submitted to ALS Environmental.

2. Unless otherwise agreed in a formal contract, services provided by ALS Environmental are expressly limited to the terms and conditions stated on the reverse.

3. The Chain of Custody is a legal document. All information must be completed accurately.

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ALS Group USA, Corp

Sample Receipt Checklist

Client Name: WESTON - CHI

Date/Time Received: 01-Apr-14 09:30

Work Order: 1404058

Received by: KRW

Checklist completed by Keith Wierenga
eSignature

01-Apr-14
Date

Reviewed by: Tom Beamish
eSignature

01-Apr-14
Date

Matrices: Water
Carrier name: FedEx

Shipping container/cooler in good condition?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	Not Present <input type="checkbox"/>
Custody seals intact on shipping container/cooler?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	Not Present <input checked="" type="checkbox"/>
Custody seals intact on sample bottles?	Yes <input type="checkbox"/>	No <input type="checkbox"/>	Not Present <input checked="" type="checkbox"/>
Chain of custody present?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Chain of custody signed when relinquished and received?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Chain of custody agrees with sample labels?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Samples in proper container/bottle?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Sample containers intact?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Sufficient sample volume for indicated test?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
All samples received within holding time?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Container/Temp Blank temperature in compliance?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Sample(s) received on ice?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	
Temperature(s)/Thermometer(s):	<u>3.4 C</u>		
Cooler(s)/Kit(s):			
Date/Time sample(s) sent to storage:	<u>4/1/2014 3:00:31 PM</u>		
Water - VOA vials have zero headspace?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	No VOA vials submitted <input type="checkbox"/>
Water - pH acceptable upon receipt?	Yes <input checked="" type="checkbox"/>	No <input type="checkbox"/>	N/A <input type="checkbox"/>
pH adjusted?	Yes <input type="checkbox"/>	No <input checked="" type="checkbox"/>	N/A <input type="checkbox"/>
pH adjusted by:			

Login Notes:

Client Contacted:

Date Contacted:

Person Contacted:

Contacted By:

Regarding:

Comments:

CorrectiveAction: